

# METHODS FOR THE DETERMINATION OF FILM CONTINUITY AND GROWTH MODES IN THIN DIELECTRIC FILMS

## Abstract

The invention provides methods for determining film continuity and growth modes in thin dielectric films. The continuity determining method comprises: depositing a material on the substrate using a first value of a growth metric; depositing an amount of charge on a surface of the material; repetitively measuring a surface voltage of the material until an onset of tunneling to provide a  $V_{\text{tunnel}}$  (or  $E_{\text{tunnel}}$ ) value; repeating the above steps for different values of the growth metric; and comparing the  $V_{\text{tunnel}}$  (or  $E_{\text{tunnel}}$ ) values for different values of the growth metric to provide a measure of the continuity of the material on the substrate. The growth modes of the material can be determined by comparing the first derivative of the  $V_{\text{tunnel}}$  or  $E_{\text{tunnel}}$  per growth metric curve versus the growth metric, and examining the linearity of the results of the comparison.